Chemical Safety Data Sheet MSDS / SDS

4-pyridylamine SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: 4-pyridylamine

CAS: 504-24-5

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Acute toxicity - Category 2, Oral
Skin irritation, Category 2

Eye irritation, Category 2
Specific target organ toxicity – single exposure, Category 3
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H300 Fatal if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation
H335 May cause respiratory irritation
H411 Toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response

P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P332+P317 If skin irritation occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.

P391 Collect spillage.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	4-pyridylamine
Common names and synonyms:	4-pyridylamine
CAS number:	504-24-5
EC number:	207-987-9
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Material may be fatal if inhaled, swallowed or absorbed through skin. Contact may cause burns to skin and eyes. Material affects neural transmission. In sufficient concentrations, material may cause metabolic acidosis, respiratory arrest, and cardiac arrhythmias. (EPA, 1998)

Indication of immediate medical attention and special treatment needed, if necessary

Pancuronium is a pharmacologic antidote and is recommended in severely poisoned human patients. Propranolol appears to block some of the cardiac toxicity (such as cardiac arrhythmias) of 4-aminopyridine. Seizures can be treated with diazepam. In severe cases, phenobarbital or phenytoin can be given, if no response to diazepam. In case of avitrol ingestion, general symptomatic and supportive treatment includes emesis, gastric lavage, activated charcoal, and cathartic sodium thiosulfate. Bicarbonate should be added tot he fluids to treat acidosis.

SECTION 5: Firefighting measures

Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Special protective equipment for firefighters: Wear self contained breathing apparatus for fire fighting if necessary.

Specific hazards arising from the chemical

Material may produce irritating or poisonous gases in fire. Runoff from fire control water may give off irritating or poisonous gases. (EPA, 1998)

Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours.Avoid contacting with skin and eye. Use personal protective equipment.Wear chemical impermeable gloves. Ensure adequate ventilation.Remove all sources of ignition. Evacuate personnel to safe areas.Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Personal precautions: Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. Methods and materials for containment and cleaning up: Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Pyridine, 4-amino- is a white crystalline material with no odor. Used as an avicide, an intermediate and as a fixer for some textile dyes. (EPA, 1998) It has been approved by the FDA for use as a treatment for multiple sclerosis.
Colour:	White crystals
Odour:	Odorless
Melting point/freezing point:	210°C(lit.)

Boiling point or initial boiling point and boiling range:	273°C(lit.)
Flammability:	no data available
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	9°C(lit.)
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	no data available
Partition coefficient n-octanol/water:	log Kow = 0.32
Vapour pressure:	2.09X10-4 mm Hg at 20 deg C
Density and/or relative density:	1.26
Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

No rapid reaction with air. No rapid reaction with water.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

PYRIDINE, 4-AMINO- neutralizes acids in exothermic reactions to form salts plus water. May be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Flammable gaseous hydrogen may be generated in combination with strong reducing agents, such as hydrides.

Conditions to avoid

no data available

Incompatible materials

Strong oxidizing agents, Strong acids, Acid chlorides, Acid anhydrides

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Dog oral 3.7 mg/kg

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: Lepomis macrochirus (Bluegill); Conditions: freshwater, static; Concentration: 2820 ug/L for 96 hr (95% confidence interval: 2300-3500 ug/L)

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water Flea) juvenile; Conditions: freshwater, static, 21 deg C, hardness 40 mg/L CaCO3; Concentration: 17000 ug/L for 24 hr; Effect: intoxication, immobilization /formulation

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: 4-Aminopyridine, present at 100 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). In a screening test, which utilized 5 mL garden soil suspensions with glucose, yeast extract and mineral salts, 4-aminopyridine completely degraded in greater than 170 days under both aerobic and anaerobic conditions(2). For flooded soils, 76.4 and 79.0% of the original radio labeled 4-aminopyridine was mineralized to CO2 within 60 days in a Fargo clay and Barnes sandy loam soil at 20 deg C and pHs of 7.7, and 7.4, respectively(3). In addition, only 6, 18 and 24% of the original radio labeled 4-aminopyridine was mineralized to CO2 within 60 days in a Barnes sandy loam, Towner loamy fine sand and Fargo clay at 20 deg C and pHs of 7.4, 7.2 and 7.7, respectively(3). An aerobic biological screening study, which utilized a 10 mg/L yeast extract and an Aeric Ochraqualf soil for inocula, indicated that 4-aminopyridine is not readily biodegradable(4); at 28 deg C and a pH of 7, less than 1% of an initial 14.6 ppm of 4-aminopyridine was mineralized in greater than 30 days as evidenced via the release of inorganic nitrogen(4). An acclimated aerobic soil grab sample study demonstrated slow biodegradation of 4-aminopyridine(5). 4-Aminopyridine was added to Fincastle silt loam (Aeric Ochraqualf) with a pH of 6.7 and incubated at 25 deg C(5); within 64 days, 6.1% of the available nitrogen was released to inorganic forms(5); sterilized controls lost 14.9% of the starting material to volatilization, but did not release inorganic nitrogen(5). Aerobic biotic half-lives of 4-aminopyridine in soil are reported to range between 3 and 32 months(6).

Bioaccumulative potential

BCF values of <0.2-0.6 (at 50 mg/L) and <1.8-7.2 (at 5 mg/L concentration) were measured in carp (Cyprinus carpio) which were exposed over an 8-week period for 4-aminopyridine(1). According to a classification scheme(2), these BCF ranges suggest the potential for bioconcentration in aquatic organisms is low.

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc for 4-aminopyridine can be estimated to be 35(SRC). According to a classification scheme(2), this estimated Koc value suggests that 4-aminopyridine is expected to have very high mobility in soil. The pKa of 4-aminopyridine is 9.17(3), indicating that this compound will exist predominantly in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4). In addition, aromatic amines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(5,6), suggesting that mobility may be much lower in some soils(SRC).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN2671 (For reference only, please check.)
IMDG: UN2671 (For reference only, please check.)
IATA: UN2671 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: AMINOPYRIDINES (o-, m-, p,) (For reference only, please check.)
IMDG: AMINOPYRIDINES (o-, m-, p,) (For reference only, please check.)
IATA: AMINOPYRIDINES (o-, m-, p,) (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)
IMDG: 6.1 (For reference only, please check.)
IATA: 6.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: Yes

IMDG: Yes
IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

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